

PRELIMINARY Documentation for DSP Audio Processor Boards

04/10/2021

This is not the final information on the boards for Chapter 11 & 12 Pre & Post processors. I will put all documentation, including Schematics, BOMs, assembly notes, pictures and gerbers [and I am guessing now software too] on both the GroupsIO and my website [k9ivb.net].

In an attempt to sort out the available schematic wiring and find some order for perf board construction led to the display interface. I think it is a fairly simple approach to have a common 10 pin cable from the Teensy to any of the TFT displays with the same pin out. Billy, NN5EE is working on getting the ILI9341 to work. Cap is 0.1uF 0805 and the resistor is 150 ohm through hole or 0805.

The next board was the Extender for the T4.0 to get the 10 pads on the bottom out to a place that was stable enough so the T4 could be separated from the breadboard. The resistors and caps are all 0805 with R = 10 K and C = 1000pf. If the board is to be permanent solder to both with a 5 pin dual extended pin header. If it may be removed use a male and female extended header. If you like perpendicular instead of flat use a 5 pin 90 deg on the T4. Just attach the finished board to the T4 and do the inside wires before the outside.

I bought some push-lock switches and caps thinking they would work on perf board. The switches has 2.5mm between pins but 6mm between rows. Enter the third PCB. Set the board up to be easy to drill holes in a panel or for my 3D printer. Links to my source for the switches and caps, below. The 8x8 mm are available from ebay or Amazon. My LED's are old Siemens T1 parts and look bright enough with either 560 or 680 ohm resistors to 5V [5 or 6 ma].

Push Lock DPDT switches 8x8mm with 2.5-2.5 x 6mm pin spacing that fit PCB <https://www.ebay.com/itm/20-Pcs-8mm-x-8mm-x-17mm-Latching-Tactile-Tact-Push-Button-Switch-Self-Lock-6-Pin/323745621698?ssPageName=STRK%3AMEBIDX%3AIT&trksid=p2060353.m2749.l2649>

Caps for above Push Lock Switches <https://www.ebay.com/itm/40Pcs-Plastic-6x7mm-Latching-Pushbutton-Tactile-Switch-Caps-Cover-Keycaps-Black/312531004007?ssPageName=STRK%3AMEBIDX%3AIT&trksid=p2060353.m2749.l2649>

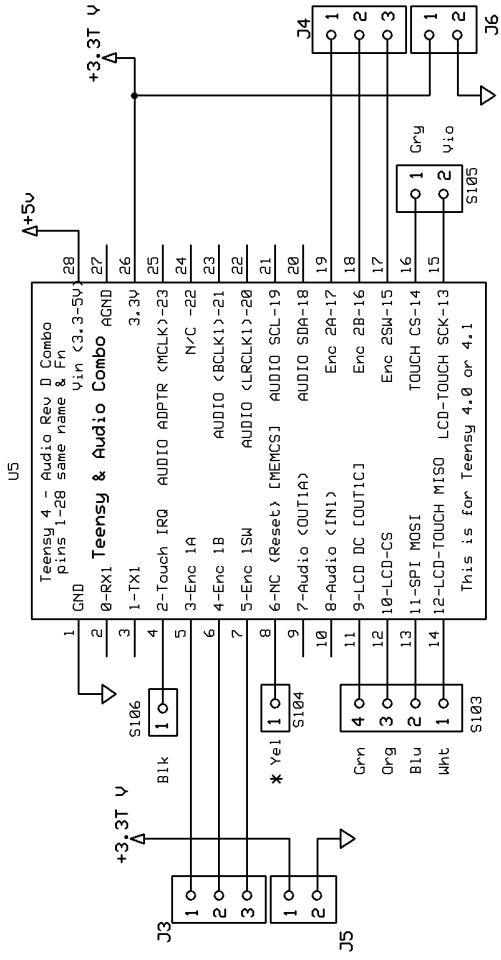
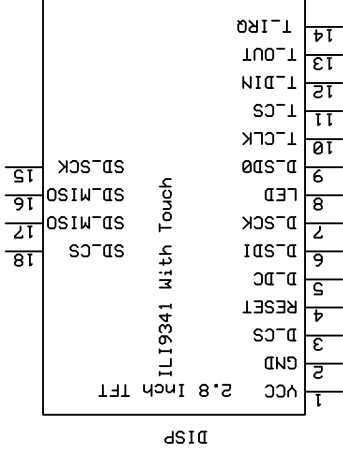
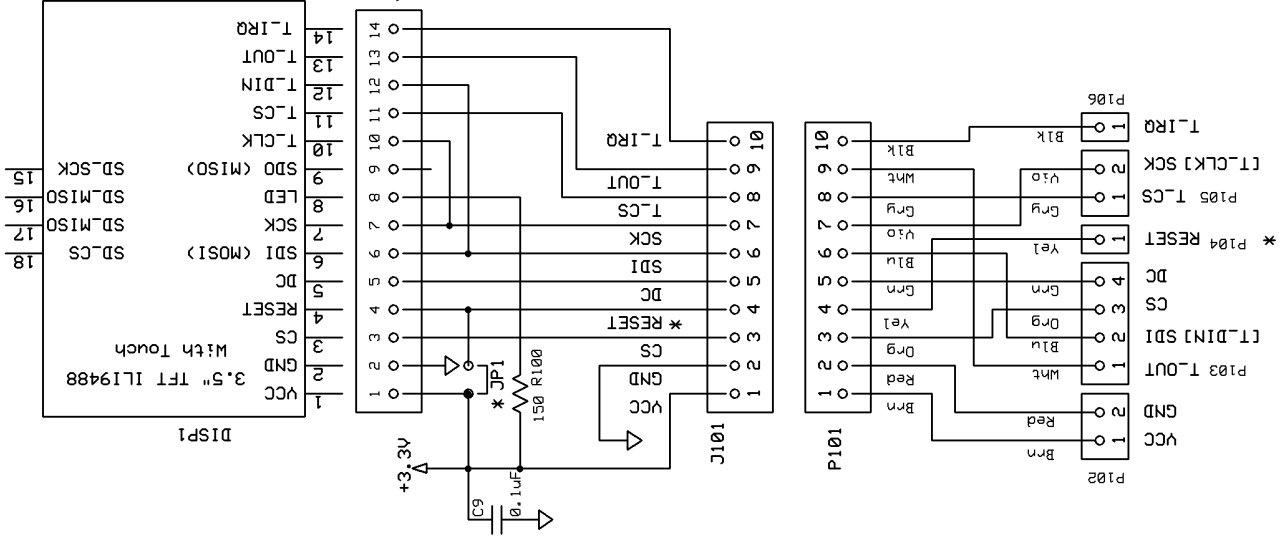
Double Male Pin Stacking header https://www.amazon.com/gp/product/B00U8OCENY/ref=ppx_yo_dt_b_asin_title_o00_s00?ie=UTF8&psc=1

The plan is to put the Audio board on the bottom with extended length female headers and stack the T4 and Extender on top, also using extended male pins for the rotary encoders. I have some MB102 regulator boards for 5V & 3.3V power. To get things up and running there will not be a need for any perf board until the audio work begins.

Please note that in all of the schematics the Teensy 4.0 and the Audio Adapter Rev D have been combined into a single 28 pin "new part" and two separate symbols are used for the unique pins. The schematic becomes very messy if you try to show two 28 pin devices connected pin for pin [they are stacked and impossible to miss- wire unless one is backwards].

The last page is more of a system diagram. It is the result from where I started. But, sure would not want to try to wire up the circuit from that page. Need to make sure all of the pins, symbols and ref designators match up to the other schematics. The 3.3V regulator needs to be connected to +5V not to +12V. Note, Class D audio amps like used in book [PAM8610 -CH11 & PAM8403-Ch12] have floating outputs that do not like to be connected together or to gnd [like with headphones]. Some of the LM386 modules may need R2 & C4 values changed to what is in the data sheet [R2=10 ohms, C2 = 0.05uf]

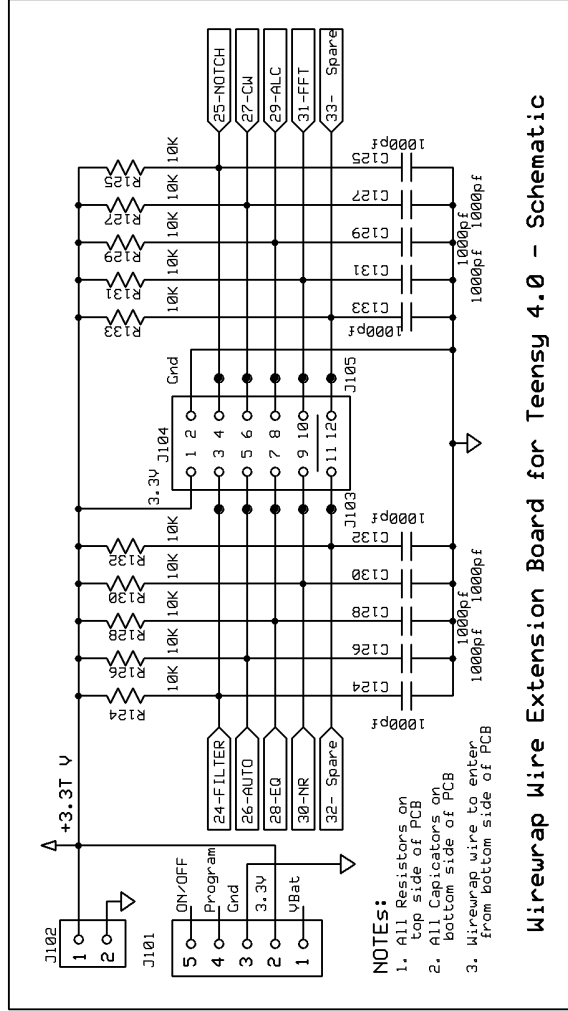
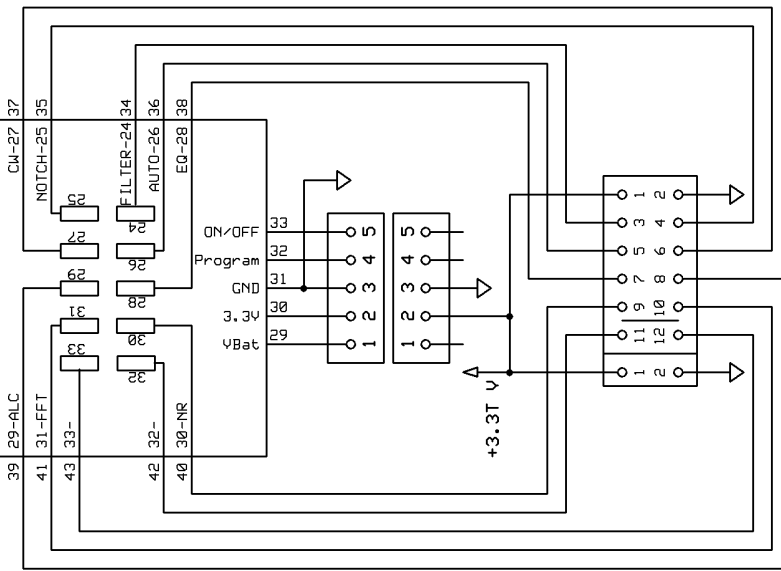
Dick Faust K9IVB
9512 W Burns Dr
Sun City, AZ 85351
623-875-6653 [landline]
k9ivb@cox.net and others



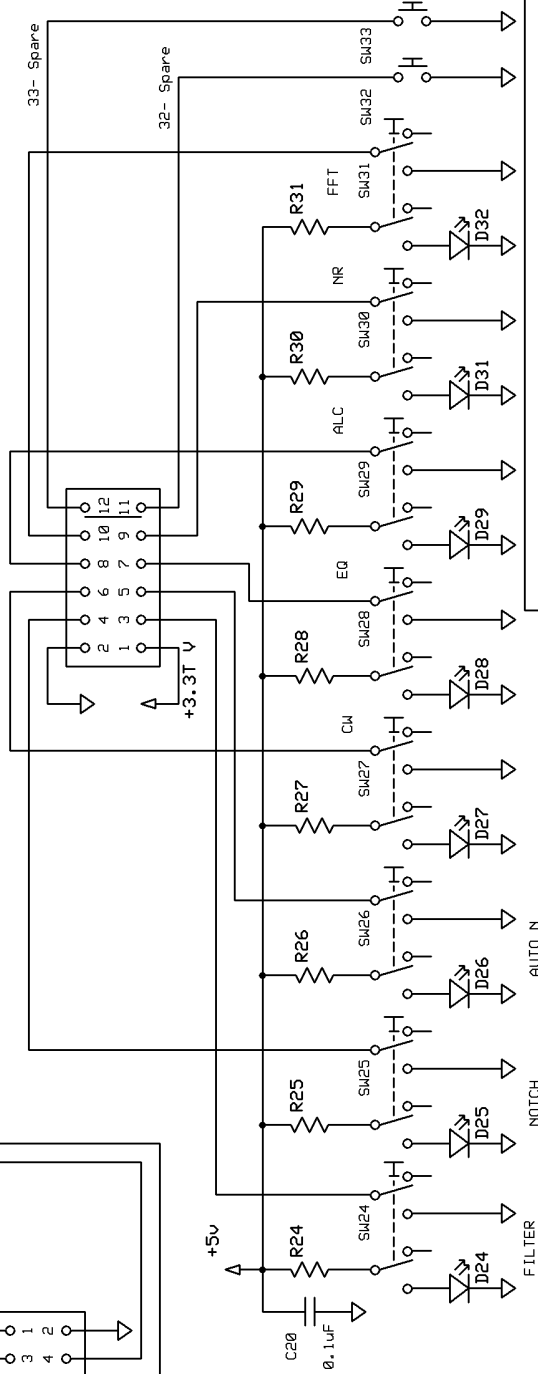
TFT Display Interface Adapter Schematic

* Do Not connect P104 if J1 is installed

U Teensy 4.0 Unique Pins



Wirewrap Wire Extension Board for Teensy 4.0 - Schematic



NOTES:
 The board is designed to mount on the 5 end pins of the Teensy 4.0.
 If stacking headers are used on T4.0, the corners may need to be removed.
 If the T4.0 side pins protrude through the adapter end holes, there is no need to solder.
 The board may be mounted vertical or horizontal with appropriate mechanical parts.
 Solder the #30ga wires to the adapter before mounting on the T4.0.
 The 5 even # wires should be connected first. [Located under the odd # wires.]

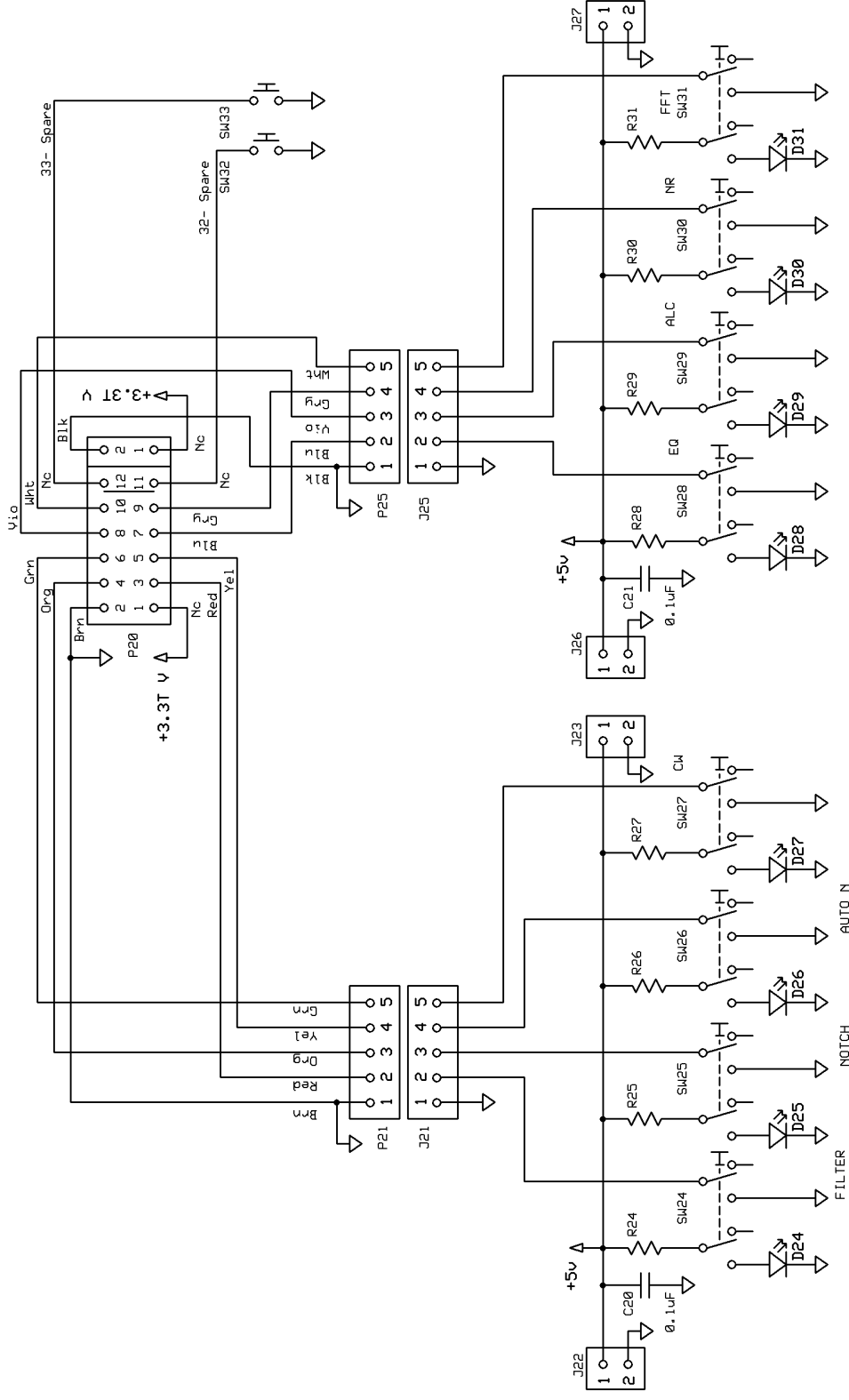
Teensy 4.0 Extension I-O Board

Schematics & Wiring

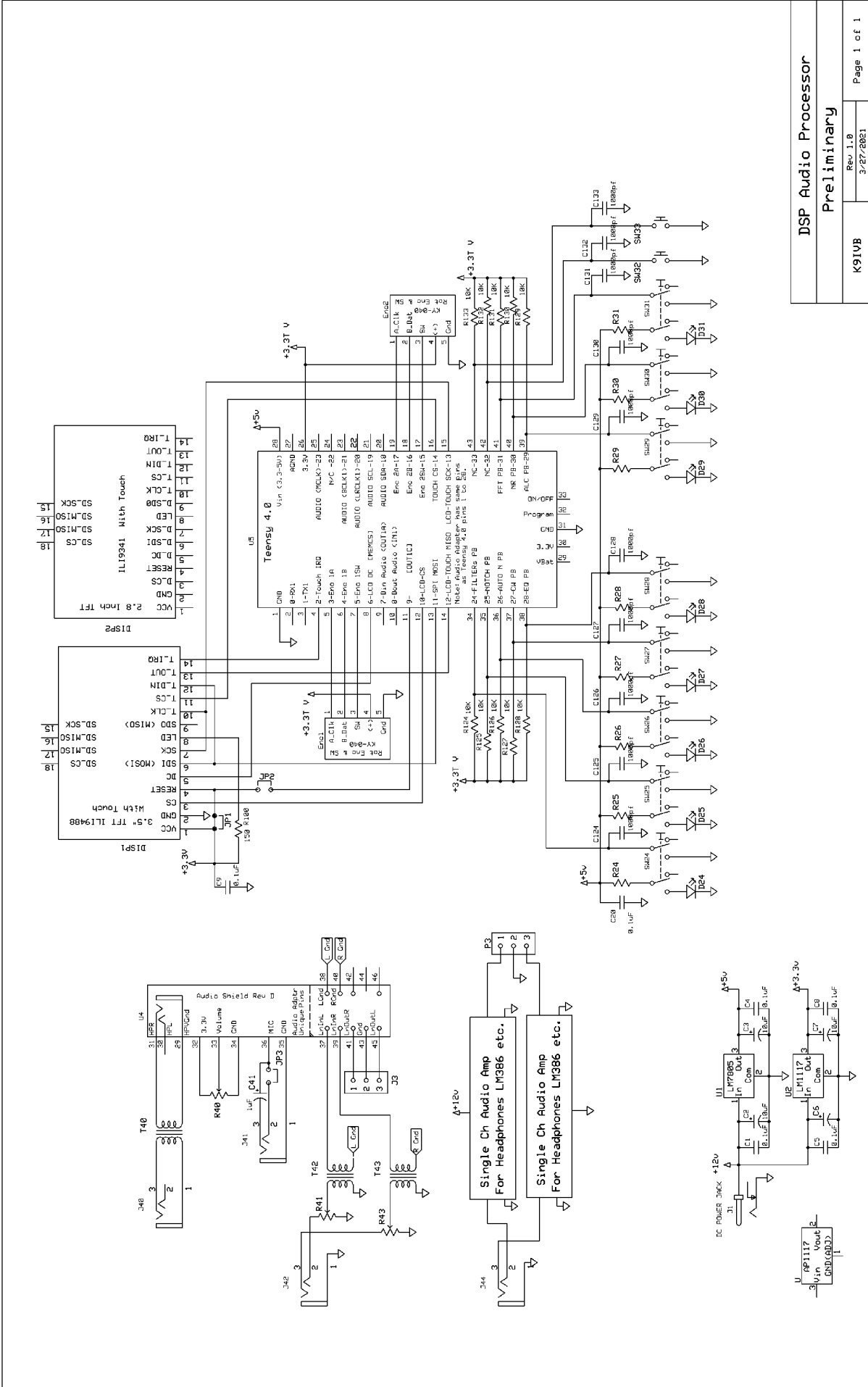
K9IYB

Rev 2.0
4/1/2021

Page # or name



Push-Button and LED Board	
4 or 8 Buttons and LED's	
K9IYB	Page # or name
Rev 1.0	4/4/2021



DSP Audio Processor
Preliminary

Rev 1.0
3-27-2021

K91VB